LIVERMORE LAB
REPORT

A weekly review of scientific and technological achievements from Lawrence Livermore National Laboratory, June 24-28, 2013.

GOING DOWN IN HISTORY

LLNL Director Parney Albright and Livermore Mayor John Marchand hold a proclamation in front of a Livermorium flag in the newly named Livermorium Plaza in downtown Livermore.

The city of Livermore and Lawrence Livermore National Laboratory went down in the history books Monday as employees and city officials celebrated the discovery of the two heaviest elements on the periodic table -- 114, Flerovium, and 116, Livermorium.

The day started with a colloquium hosted by the Laboratory, titled "Elemental Science: Livermorium and the Periodic Table," with distinguished lecturers. Congressman Eric Swalwell and LLNL Director Parney Albright kicked off the celebration acknowledging the collaboration between Lawrence Livermore scientists and researchers from the Flerov Institute in Dubna, Russia, who discovered six heavy elements (113-118), including the latest, Flerovium and Livermorium. Earlier in the day, Swalwell presented a certificate of appreciation to the LLNL scientists responsible for discovering Livermorium.

Following the colloquium, the City of Livermore hosted a dedication ceremony in downtown Livermore at the plaza. Mayor John Marchand renamed the locale as Livermorium Plaza and

introduced a special plaque dedicated to the discovery team. Marchand presented a Livermorium flag to Albright in recognition of the latest element being named for LLNL and the city of Livermore.

To read more, go to NBC.

A PREVAILING WIN

Lawrence Livermore National Laboratory's 20-petaflop Sequoia supercomputer has retained its No. 1 ranking on the Graph 500 list, a measure of a system's ability to conduct analytic calculations -- finding the proverbial needle in the haystack.

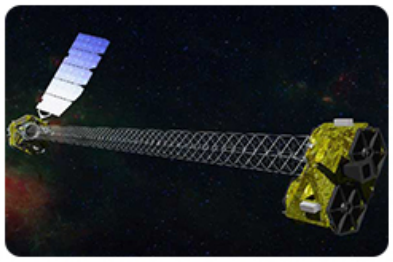
The new Graph 500 list was announced at the International Supercomputing Conference (ISC'13) in Leipzig, Germany earlier this month. Sequoia has held the top ranking on the Graph 500 since November 2011.

"The Graph 500 provides an additional measure of supercomputing performance, a benchmark of growing importance to the high performance computing (HPC) community," said Jim Brase, deputy associate director for Big Data in LLNL's Computation Directorate. "Sequoia's top Graph 500 ranking reflects the IBM Blue Gene/Q system's capabilities. Using this extraordinary platform Livermore and IBM computer scientists are pushing the boundaries of the data-intensive computing critical to our national security missions."

To read more, go to HPC Wire.

ScienceDaily

LUCKY STAR



NuSTAR recently spotted a feeding black hole

NuSTAR -- the nuclear spectroscopic telescope array -- has been busy studying the most energetic phenomena in the universe. Recently, a few high-energy events have sprung up, akin to "things that go bump in the night." When one telescope catches a sudden outpouring of high-energy light in the sky, NuSTAR and a host of other telescopes stop what they are doing and take a better look.

NuSTAR got lucky in the case of the blazar Markarian 421, which had an episode of extreme activity, brightening by more than 50 times its typical level. Blazars are a special class of galaxies with accreting, or "feeding," supermassive black holes at their centers. NuSTAR was already observing the blazar at the time of its eruption, simultaneously with other telescopes, including NASA's Fermi and Swift satellites. The flare-up was the brightest ever observed for this object. In fact, it was so bright that NuSTAR and other telescopes changed their observing cadence to spend more time studying this galaxy.

The Laboratory was involved in both the design and testing of the X-ray optics that fly on NuSTAR.

To read more, go to *Science Daily*.

RENEWABLE ENERGY WORLD.COM

SO HOT IT'S COOL

The Cool Earth concentrator photovoltaic (CPV) system is undergoing testing to provide solar power.
Lawrence Livermore Laboratory and industry partner Cool Earth Inc. are using the light of the sun to power 100 kilowatts of unique concentrating photovoltaic (CPV) modules at the Livermore Valley Open Campus' Clean Energy Demonstration Field.

Under a partnership with Lawrence Livermore, the California Energy Commission awarded $1.7 million to test how communities can integrate solar. Cool Earth is matching the award with $1 million.

"This is an issue that can be addressed by better solar power forecasting to allow active balancing on the grid, including adaptive building energy management," said Wayne Miller, Lawernce Livermore's lead on the project. "This project will develop and test the efficacy of this approach."

To read more, go to *Renewable Energy World*.

LIVERMORE LAB REPORT TAKES A BREAK

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The *Livermore Lab Report* will take a break for the week of July 1-5 due to the Fourth of July holiday. It will return July 12.

LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental

needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance. To send input to the *Livermore Lab Report*, send e-mail.